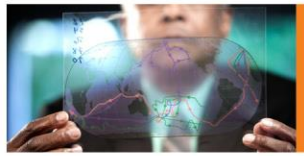
CADMUS



Major Changes to the 2018 IECC for Residential and Commercial Buildings

Eric Makela

Cadmus

MEEA 2017 Energy Codes Conference

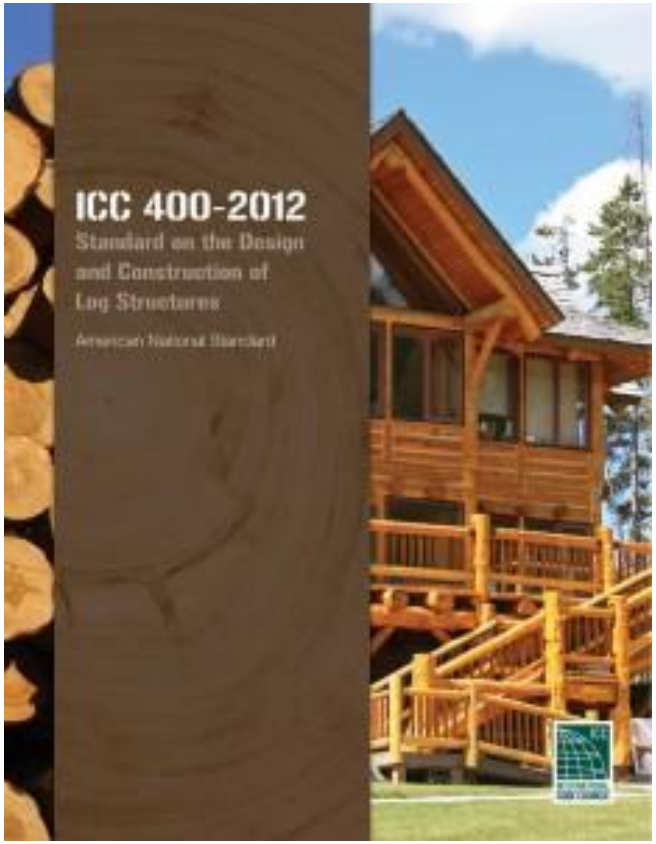
Cadmus Codes and Standards Services

"We are committed to delivering cross-disciplinary services and solutions that help our clients achieve their goals and, in doing so, create social and economic value and improve people's lives."

- Cadmus Philosophy

Market	Development	Adoption	Implementation/ Compliance	Evaluation	Related
Domestic	✓		✓	✓	✓
International	✓	✓	✓	✓	✓

New Standards

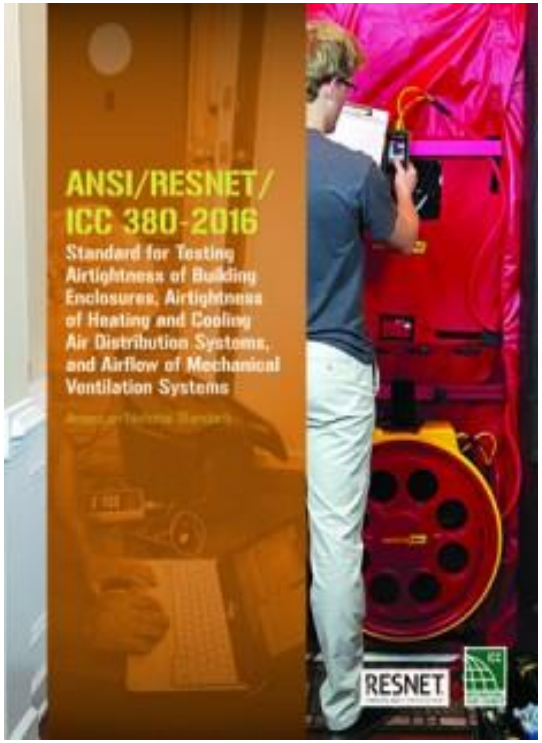


- ICC 400 Log Home Standard
- Can comply with the energy provisions as deemed to comply with the IECC

Envelope – Glazing U-factors

Table R402.1.2 Insulation and Fenestration Requirements by Component		
Climate Zone	**2015 Glazing U-factor**	**2018 Glazing U-factor**
1	NR	NR
2	0.40	0.40
3	0.35	0.32
4	0.32	0.32
5	0.32	0.30
6	0.32	0.30
7	0.32	0.30
8	0.32	0.30

Reference RESNET/ICC 380-2016 for Building Envelope Testing



Standard for Testing Airtightness of Building Enclosures, Airtightness of Heating and Cooling Air Distribution Systems, and Airflow of Mechanical Ventilation Systems”

- Provides clear guidance on how to conduct an envelope air leakage test
- Standard will be used by all HERS raters in the industry
- Standard 380 allows for single point test In addition to multipoint as required by ASTM E 779

Ductwork

Figure 1. Buried Ducts: Insulated HVAC Ducts Buried within Fiberglass Ceiling Insulation.

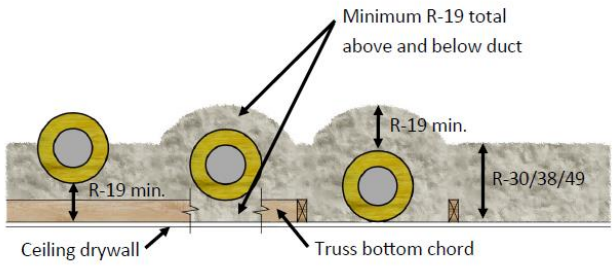
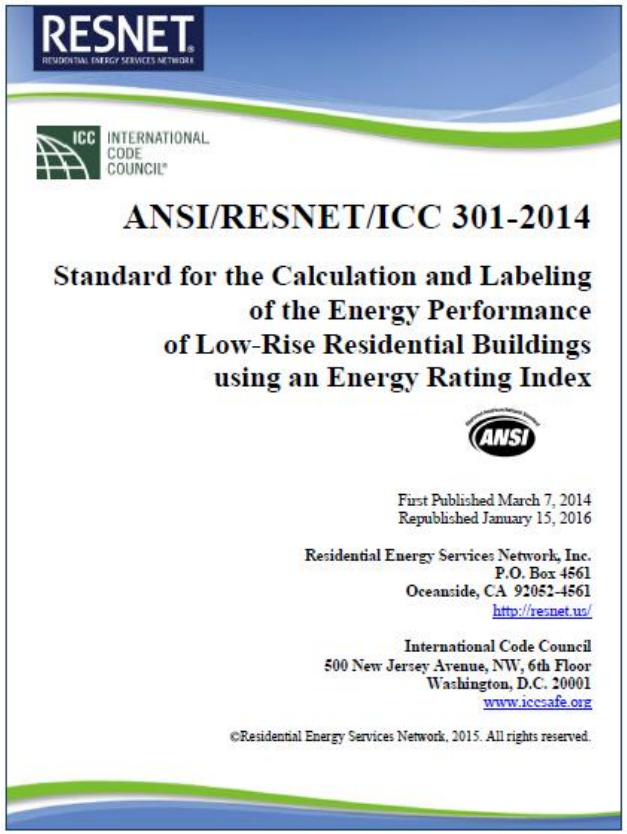


Figure 2. *Example partially buried duct (left), buried duct across the truss bottom truss chord (middle), and buried duct on the ceiling (right).*

- Allows for ductwork to be buried in insulation
- Can be considered in conditioned space if
  - Maximum leakage rate of 1.5 cfm/100ft^2 of floor area
  - Total ceiling insulation against and above duct is equal to proposed ceiling insulation minus duct insulation

Home Innovation RESEARCH LABS™

ERI Approach and ANSI/RESNET/ICC 301-2014


RESNET
RESIDENTIAL ENERGY SERVICES NETWORK

ICC INTERNATIONAL CODE COUNCIL

ANSI/RESNET/ICC 301-2014

Standard for the Calculation and Labeling of the Energy Performance of Low-Rise Residential Buildings using an Energy Rating Index

ANSI

First Published March 7, 2014
Republished January 15, 2016

Residential Energy Services Network, Inc.
P.O. Box 4561
Oceanside, CA 92052-4561
http://resnet.us/

International Code Council
500 New Jersey Avenue, NW, 6th Floor
Washington, D.C. 20001
www.iccsafe.org

- Code change proposal reference RESNET/ICC 301 as a basis for the ERI approach
  - Gives credit for on-site power production
  - Defines renewables
    - Solar energy
    - Wind energy
    - Biomass

Consensus Agreement on Renewables

- Kumbaya moment resulting in
  - 2015 “backstop” if taking credit for renewables
  - 2009 “backstop” if not taking credit for renewables
- Increased ERI scores

2018 IECC ERI Scores		
Climate Zone	2018 ERI Score	2015 ERI Scores
1 – 2	57	52
3	57	51
4	62	54
5	61	55
6	61	54
7-8	58	53

Renewable Agreement Supporters

- North American Insulation Manufacturers Association
- Leading Builders of America
- RESNET
- National Association of Home Builders
- ACC Center for the Polyurethanes Industry
- Extruded Polystyrene Foam Association
- Foam Sheathing Coalition
- Cellulose Insulation Manufacturers
- Trane
- Solar Energy Industries Association
- Natural Resources Defense Council
- Energy Efficient Codes Coalition
- American Council for an Energy Efficient Economy
- Building Codes Assistance Project
- Institute for Market Transformation

Lighting Equipment (Prescriptive)

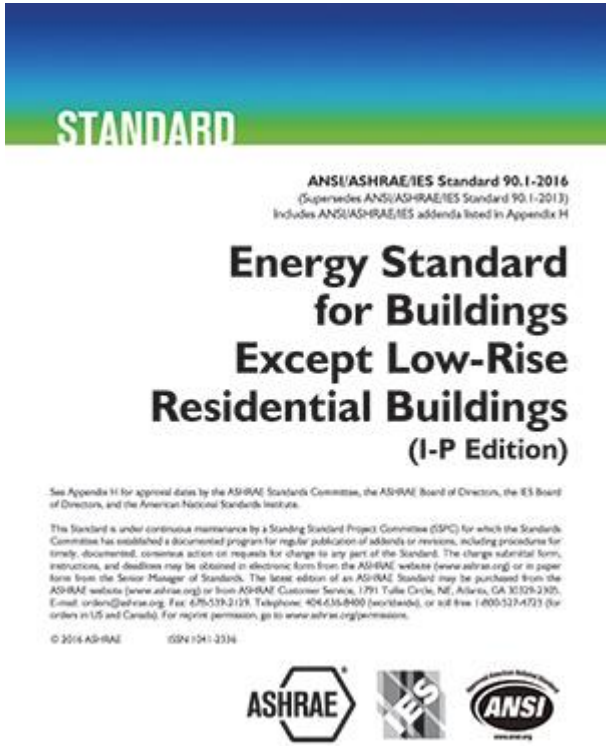
- A minimum of 90 percent of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps

Major Commercial Proposals Adopted into the 2018 IECC

Summary of Changes (from DOE)

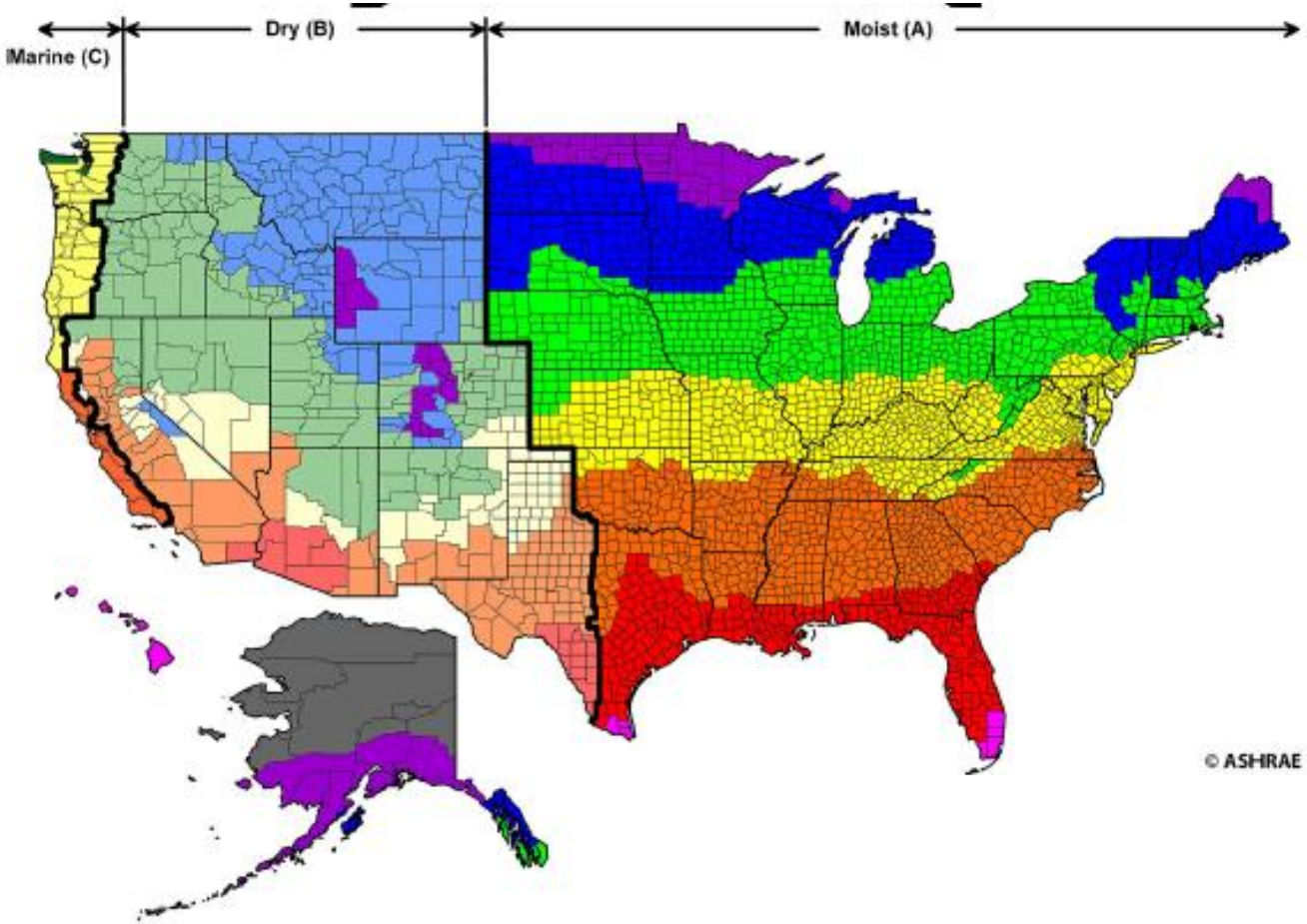
- Total of 129 approved proposals
- Section 4 (mechanical) completely reorganized
- 36 proposals increase energy efficiency, 3 major
- 10 proposals reduce energy efficiency, 2 major

New ASHRAE Reference



- ASHRAE 90.1 – 2016
  - Major format changes
  - New climate maps
    - Approximately 10% reassigned to warmer climates
  - New performance-based compliance path

Climate Zone Modifications (ASHRAE not the IECC)



- Zone 0A Extremely Hot Humid
- Zone 0B Extremely Hot Dry
- Zone 1A Very Hot Humid
- Zone 1B Very Hot Dry
- Zone 2A Hot Humid
- Zone 2B Hot Dry
- Zone 3A Warm Humid
- Zone 3B Warm Dry
- Zone 3C Warm Marine
- Zone 4A Mixed Humid
- Zone 4B Mixed Dry
- Zone 4C Mixed Marine
- Zone 5A Cool Humid
- Zone 5B Cool Dry
- Zone 5C Cool Marine
- Zone 6A Cold Humid
- Zone 6B Cold Dry
- Zone 7 Very Cold
- Zone 8 Subarctic/Arctic

Building Envelope Changes

- SHGC modifications in colder climate zones (Glazing Industry Code Committee)

CLIMATE ZONE	1		2		3		4 EXCEPT MARINE		5 AND MARINE 4		6		7		8	
SHGC																
Orientation[a]	SEW	N	SEW	N	SEW	N	SEW	N	SEW	N	SEW	N	SEW	N	SEW	N
PF	0.25	0.33	0.25	0.33	0.25	0.33	~~0.40~~ 0.36	~~0.53~~ 0.48	~~0.40~~ 0.38	~~0.53~~ 0.51	0.40	0.53	0.45	NR	0.45	NR
0.2 ≤ PF	0.30	0.37	0.30	0.37	0.30	0.37	~~0.48~~ 0.43	~~0.58~~ 0.53	~~0.48~~ 0.46	~~0.58~~ 0.56	0.48	0.58	NR	NR	NR	NR
PF > 0.5	0.40	0.40	0.40	0.40	0.40	0.40	~~0.64~~ 0.58	~~0.64~~ 0.58	~~0.64~~ 0.61	~~0.64~~ 0.61	0.64	0.64	NR	NR	NR	NR

HVAC Systems

- Complete restructuring of HVAC provisions

- Grouped HVAC provisions together
  - Controls
  - Dampers
  - Variable Air Volume
  - Fan systems
  - Exhaust systems
- Hotel/Motel Guest Room Controls
  - Setback/up system when unoccupied

Interior Lighting Systems

Table C405.4.2(1) Interior Lighting Power allowances: Building Area Method		
Building Area Type	**2015 LPD (w/ft2)**	**2018 LPD (w/ft2)**
Dining: Cafeteria/fast food	0.9	0.79
Dining: Family	0.95	0.78
Fire Station	0.67	0.53
Hospital	1.05	1.05
Hotel/Motel	0.87	0.75
Manufacturing Facility	1.17	0.90
Office	0.82	0.79
Parking Garage	0.21	0.15
Penitentiary	0.81	0.75
Religious Building	1.0	0.94
Retail	1.26	1.06
School/University	0.87	0.81
Warehouse	0.66	0.48
Workshop	1.19	0.90

Interior Lighting Systems

Additional Interior Lighting Power		
Building Area Type	**2015 LPD (w/ft2)**	**2018 LPD (w/ft2)**
	500 W +	1000 W +
Retail Area 1: All products not listed in Retail Area 2, 3 or 4	0.06	0.45
Retail Area 2: Sale of vehicles, sporting goods and small electronics	0.06	0.45
Retail Area 3: Sale of furniture, clothing, cosmetics and artwork	1.4	1.05
Retail Area 4: Sale of jewelry , crystal and china	0.25	1.87

Exterior Lighting Systems

- Exterior Lighting Power Allowances
  - Reduction in Base Site Allowance for all zones
  - Reduction for:
    - Uncovered parking areas
    - Building grounds
    - Building entrances and exits
    - Sales canopies
    - Outdoor sales
    - Non-tradeable surfaces

Options Packages (NWECG)

Enhanced envelope performance	UA of thermal envelope is 15% below the UA of code compliant thermal envelope
Reduced air infiltration	Tested air leakage no greater than 0.25 cfm/ft^2

Commissioning

Require commissioning compliance checklist for preliminary commissioning report	Checklist ensures that commissioning has been executed for all required systems
	Checklist requires information on when follow-up testing will occur

Renewables

- Require solar ready zone
  - Minimum roof area for solar
  - Roof loads and documentation
  - Interconnection pathway
  - Electrical service reserved space
  - Construction documentation certificate

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